

EASTERN MEDITERRANEAN UNIVERSITY
COURSE OUTLINE

COURSE CODE	MATH106	COURSE LEVEL	Undergraduate SPRING 2018-2019
COURSE TITLE	Linear Algebra		
COURSE TYPE			
LECTURER(S)	Groups	Instructors	Assistants
	01	Dr. Fatma Rızaner Office : AS118, Tel : 2281 fatma.bayramoglu@emu.edu.tr	Res. Asst. Sedef Emin Office : AS149, Tel : 2194 sedef.emin@emu.edu.tr
	02	Dr. Neşet Deniz Turgay Office : AS325, Tel : 2412 neset.turgay@emu.edu.tr	Res. Asst. Gizem Baran Office : AS149, Tel : 2194 gizem.baran@emu.edu.tr
	03	Dr. Sinem Unul Babagil Office : AS315, Tel : 2409 sinem.unul@emu.edu.tr	Res. Asst. Sedef Emin Office : AS149, Tel : 2194 sedef.emin@emu.edu.tr
CREDIT VALUE	(3,1) 3	ECTS VALUE	6
PREREQUISITES	None		
COREQUISITES			
DURATION OF COURSE	One semester		
WEB LINK	http://brahms.emu.edu.tr/fbayramoglu		
CATALOGUE DESCRIPTION			
Systems of linear equations: elementary row operations, echelon forms, Gaussian elimination method; Matrices: elementary matrices, invertible matrices, symmetric matrices; Determinants: adjoint and inverse matrices, Cramer's rule. Vector spaces: linear independence, basis and dimension, Euclidean spaces. Linear mappings: matrix representations, changes of bases; Inner product spaces: Cauchy-Schwarz inequality, Gram-Schmidt orthogonalization; Eigenvalues and eigenvectors: characteristic polynomials, Diagonalization.			
AIMS & OBJECTIVES			
The main aim of this course is to provide students with an introductory yet comprehensive overview of matrices, operations with matrices and their applications in solving linear systems. It also provides an opportunity to see basic concepts of linear algebra like linear spaces, linear transformations and some other related concepts as well as applications of earlier methods for solving linear systems to basis and dimension problems and kernel and image of linear transformations problems.			
GENERAL LEARNING OUTCOMES (COMPETENCES)			
On successful completion of this course, all students will have developed knowledge and understanding of:			
<ul style="list-style-type: none"> • Matrices, matrix operations and related concepts and problems; • Linear systems and various methods for solving the linear systems; • Basic concepts of Linear Algebra such as vector spaces, subspaces, linear mappings, linear independence and basis and dimension. • Angle and orthogonality in inner product spaces, orthogonal basis and Gram-Schmidt Process. 			
On successful completion of this course, all students will have developed their skills in:			
<ul style="list-style-type: none"> - Manipulating matrices and matrix operations, solving linear systems - Understanding algorithms as a tool to answer mathematical problems. - Improving their critical thinking in making definitions and showing their logic connections. Understanding Linear Algebra as a tool of modelling. 			
On successful completion of this course, all students will have developed their appreciation of and respect for values and attitudes regarding the issues of:			
<ul style="list-style-type: none"> - Mathematical thinking - Critical thinking. - Communication with other peoples. 			
GRADING CRITERIA			
A (excellent)	A:85-100 , A:-80-84 Excellent understanding of the concepts and the principles as demonstrated by correct and accurate knowledge and application of theory/laws in solving problems. Response to problems is clear, legible, concise and accurate. Excellent performance.		
B (good)	B+: 75-79, B:70-74 , B:- 66-69 Better than average understanding of the concepts and the principles as demonstrated by correct and accurate knowledge and application of theory/laws in solving problems, but doesn't have the depth and outstanding quality of an "A". Response to problems is fairly clear, legible, but occasionally contains some inaccuracies. Performance exceeds the minimum requirements		
C (average)	C+:63-65 , C:59-62 , C:- 56-58 An average understanding of the concepts and the principles as demonstrated by reasonably correct knowledge and application of theory/laws in solving problems, but doesn't have any depth. Response to problems is reasonably clear, legible, but contains inaccuracies. It reveals a sufficient understanding of the material, but lacks depth in understanding and approach/application. Content and form don't go beyond basic expectations and/or display some substantial errors. Acceptable but non-exceptional performance that doesn't go beyond the minimum requirements.		
D (barely sufficient)	D+:53-55 , D:50-52 Minimal knowledge and barely sufficient understanding of the concepts and the principles as demonstrated by approximately correct application of theory/laws in solving problems. Response to problems is not very clear and is barely legible, and contains many inaccuracies. It reveals a minimum (confused) understanding of the material, and lacks depth in understanding and approach/application. Content and form do not adequately meet the basic expectations, and/or display significant errors. Performance demonstrates severe problems in one or more areas.		
D- (fail)	35-49 Unsatisfactory progress in understanding of the concept and principles, unsatisfactory knowledge of the theoretical part of and insufficient skills in solving problems.		
F (fail)	Work does not meet the most minimal standards. It reveals no understanding of the material, lack of basic academic skills and knowledge, or completely incomprehensible writing. Performance is not acceptable		
NG	May be given the students not attending classes and or examinations		

RELATIONSHIP WITH OTHER COURSES

This course is related with courses such as *Abstract Algebra, Functional Analysis, and Differential Equations.*

LEARNING / TEACHING METHOD

Lectures and assignments

ASSIGNMENTS

None

METHOD OF ASSESSMENT

Course Grade will be computed as follows:

1. Midterm Exam 1 % 35
2. Quizzes % 25
3. Final Exam % 40

IMPORTANT NOTICE

- Attendance is compulsory. Any student who has less than 60% attendance and/or after the make-up examinations, still has more than one unattended exam(s) will be given NG grade.
- Students missing an examination should provide a valid excuse within three days following the examination they missed.
- The Midterm 1 and Midterm 2 make-ups will be on same date and at same time. Therefore the student is advised to take only one make-up. The make-up for the final exam and the Re-sit exam will cover all topics from week 1- 15.

ATTENDANCE

Attendance to the classes is compulsory. Students who attend the classes including lectures, lab, quiz and exams less than 60% will received **NG** grade.

TEXTBOOK/S

Howard Anton, Chris Rorres, *Elementary Linear Algebra*, 7th Ed, by, John Wiley & Sons, Inc.

INDICATIVE BASIC READING LIST

NONE

EXTENDED READING LIST

NONE

SEMESTER OFFERED

2018-2019 Spring Semester

CONTENT & SCHEDULE

WEEK	TOPICS
1 (18.2.2019-22.2.2019)	1.1 Matrices and Matrix Operations
2 (25.2.2019-1.3.2019)	1.2 Introduction to Systems of Linear Equations 1.3 Gaussian Elimination
3 (4.3.2019-8.3.2019)	1.4 Inverses; Rules of Matrix Arithmetic 1.5 Elementary Matrices and a Method for Finding A^{-1}
4 (11.3.2019-15.3.2019)	1.6 Further Results on Systems of Equations and Invertibility 1.7 Diagonal, Triangular and Symmetric Matrices
5 (18.3.2019-22.3.2019)	Chapter 2 2.1 The Determinant Function 2.2 Evaluating Determinants by Row Reduction
6 (25.3.2019-29.3.2019)	2.3 Properties of the Determinant Function
7 (1.4.2019-5.4.2019)	2.4 Cofactor Expansion; Cramer's Rule Chapter 4 4.1 Euclidean n -Space 4.2 Linear Transformations from R^n to R^m 4.3 Properties of Linear Transformations from R^n to R^m
8-9 (11.4.2019-22.4.2019)	Midterm Examinations
10 (24.4.2019-26.4.2019)	Chapter 5 5.1 Real Vector Spaces 5.2 Subspaces
11 (29.4.2019-3.5.2019)	5.3 Linear Independence 5.4 Basis and Dimension
12 (6.5.2019-10.5.2019)	5.5 Row Space, Column Space and Nullspace 5.6 Rank and Nullity
13 (13.5.2019-17.5.2019)	Chapter 6 6.1 Inner Products 6.2 Angle and Orthogonality in Inner Product Spaces
14 (20.5.2019-24.5.2019)	6.3 Orthonormal Bases; Gram-Schmidt Process Chapter 7 7.1 Eigenvalues, Eigenvectors
15 (27.5.2019-31.5.2019)	7.2 Diagonalization
17-18 (10.6.2019-22.6.2019)	Final Examinations
28.6.2019-30.6.2019	Online Application for Resit Examinations
3.7.2019-9.7.2019	Resit Examinations

PLAGIARISM

This is intentionally failing to give credit to sources used in writing regardless of whether they are published or unpublished. Plagiarism (which also includes any kind of cheating in exams) is a disciplinary offence and will be dealt with accordingly.)

PLEASE KEEP THIS COURSE SYLLABUS FOR FUTURE REFERENCE AS IT CONTAINS IMPORTANT INFORMATION